

GOOD MORNING LADIES AND GENTLEMEN, MY NAME IS BLAISE KLENOW AND I AM THE DIRECTOR OF CHRYSLER VEHICLE MANUFACTURING, INFORMATION TECHNOLOGY MANAGEMENT FOR DAIMLERCHRYSLER. IT IS A PLEASURE TO BE HERE WITH YOU THIS MORNING TO SHARE SOME THOUGHTS.

FIRST, LET ME TELL YOU A LITTLE ABOUT MY BACKGROUND. I AM A 1976 GRADUATE OF MICHIGAN STATE UNIVERSITY, COLLEGE OF ENGINEERING – WITH A BS IN COMPUTER SCIENCE. I ALSO HOLD AN MBA FROM MSU THAT I RECEIVED IN 1989 THROUGH THE EXECUTIVE MBA PROGRAM OFFERED HERE IN THIS BUILDING. I ALSO RECEIVED A PDM IN MANAGEMENT FROM THE UNIVERSITY OF MICHIGAN IN 1983, BUT SINCE MY BLOOD FLOWS GREEN, I DON'T LIKE TO TALK ABOUT IT. I HAVE BEEN WITH CHRYSLER AND DAIMLERCHRYSLER FOR 26 YEARS, 19 OF WHICH WERE IN MANUFACTURING AND ASSEMBLY SYSTEMS. I AM CURRENTLY RESPONSIBLE FOR ALL MANUFACTURING SYSTEMS FOR ASSEMBLY, POWERTRAIN, STAMPING AND COMPONENT DIVISION PLANTS. ADDITIONALLY, I SUPPORT ADVANCED MANUFACTURING ENGINEERING AND INDUSTRIAL ENGINEERING ACTIVITIES ACROSS ALL THE MANUFACTURING DIVISIONS. IN THE CURRENT DAIMLERCHRYSLER ORGANIZATION, I DO NOT HAVE RESPONSIBILITY FOR THE MATERIAL CONTROL SYSTEMS IN THE PLANTS AS THEY ARE ALIGNED WITH THE PROCUREMENT AND SUPPLY AREA OF OUR INFORMATION

TECHNOLOGY ORGANIZATION WHO SERVICE THE PROCUREMENT AND SUPPLY BUSINESS LINE.

ON A PERSONAL NOTE, I HAVE A SON AT (WHERE ELSE) MICHIGAN STATE UNIVERSITY, WHO IS JUST FINISHING HIS SECOND YEAR, STUDYING MECHANICAL ENGINEERING. AS HE IS PREPARING FOR FINALS NEXT WEEK, I LOOK FORWARD TO ANY AND ALL PREFERENTIAL TREATMENT THAT COULD BE DIRECTED HIS WAY.

SINCE I HAVE THIS SOMEWHAT CAPTIVE AUDIENCE OF ENGINEERS, I CAN NOT RESIST TELLING MY FAVORITE ENGINEER/MATHEMATICIAN JOKE. (MY WIFE, WHO I MET AT MICHIGAN STATE HAS A BS AND MS IN MATHEMATICS) AS MOST OF YOU ARE ENGINEERS OF SOME TYPE, I HOPE YOU HAVEN'T ALREADY HEARD THIS JOKE SEVERAL THOUSAND TIMES. THIS IS REALLY A TEST TO SEE IF AN INDIVIDUAL HAS THE PROPENSITY TO BECOME AN ENGINEER OR IS BETTER SUITED FOR MATHEMATICS. THE TEST CONSISTS OF TWO PROBLEMS. THE FIRST PROBLEM CONCERNS A POT OF WATER RESTING ON A TABLE NEAR A STOVE. THE PROBLEM IS HOW TO HEAT THE WATER – THE ANSWER, OF COURSE, IS TO MOVE THE POT TO THE STOVE AND HEAT THE WATER ON THE BURNER. THE SECOND PROBLEM OFFERS A VARIATION; THE POT OF WATER IS NOW ON THE FLOOR IN THE SAME KITCHEN. AN ENGINEER WOULD KNOW IMMEDIATELY THE SOLUTION WOULD BE TO

LIFT THE POT OFF THE FLOOR, PLACE IT ON THE STOVE AND HEAT THE WATER. A MATHEMATICIAN, HOWEVER WOULD LIFT THE POT FROM THE FLOOR AND PLACE IT ON THE TABLE, THUS REDUCING THE PROBLEM TO ONE HE HAD SOLVED BEFORE!.....

PROBLEMS (OR OPPORTUNITIES IN CORPORATE SPEAK) ARE PLENTIFUL IN THE MANUFACTURING ENVIRONMENT. SOLUTIONS TO THESE PROBLEMS AND BUSINESS SITUATIONS ARE THE PRIMARY JOB OF THE INFORMATION TECHNOLOGY DISCIPLINE.

#### EXAMPLES OF SYSTEMS

IN OUR ASSEMBLY PLANTS WE HAVE WHAT WE CALL THE PERFORMANCE FEEDBACK SYSTEM. WE PROVIDE MOST OF THE OPERATORS ALONG THE LINE IN BODY, PAINT AND ASSEMBLY WITH A TERMINAL. THE TERMINAL HAS THE ABILITY TO DISPLAY THE VEHICLE CURRENTLY IN STATION, ANY BUILD INFORMATION THAT IS APPLICABLE TO THAT SPECIFIC STATION. THE OPERATOR WILL NOTE ELECTRONICALLY, IF HE IS UNABLE TO PERFORM ANY OF THE OPERATIONS FOR WHICH HE IS RESPONSIBLE. THE OPERATOR ALSO CAN USE THE TERMINAL TO REPORT ANY INPROCESS DAMAGE, CALL FOR MATERIAL OR ASSISTANCE AND PERFORM ANY REQUIRED SAFETY EQUIPMENT VERIFICATIONS. ANY OPEN PROBLEMS OR CONDITIONS ARE DISPLAYED FOR RESOLUTION PRIOR TO THE VEHICLE LEAVING THE

ZONE, THE DEPARTMENT OR THE PLANT. THE AVERAGE PLANT HAS FROM 650 TO 700 TERMINALS JUST FOR THIS APPLICATION. IN ADDITION THERE ARE SEVERAL HUNDRED INTELLIGENT TOOLS (TORQUE GUNS, NUT RUNNERS, AND TESTERS) THAT ALSO PROVIDE PASS/FAIL INFORMATION FOR EACH VEHICLE. THE INFORMATION COLLECTED IS USED NOT ONLY TO HELP INSURE AN ERROR FREE BUILD, BUT TO INDICATE CHRONIC PROBLEMS AND DRIVE PROCESS CHANGES TO ELIMINATE THEM AT THEIR SOURCE.

A RECENT ADDITION TO THIS SYSTEM HELPED MANAGE A PROBLEM OF LAUNCH CONTAINMENT CONTROL. DURING A NEW VEHICLE LAUNCH IT IS OFTEN DESIRABLE TO CONTAIN SOME OF THE EARLY PRODUCTION VEHICLES UNTIL SOME OF THE EXTENDED ROAD AND DURABILITY TESTING IS COMPLETED. THE NUMBER OF VEHICLES IN CONTAINMENT CAN NUMBER IN THE THOUSANDS, OVERWHELMING A PLANT'S ABILITY TO STORE THEM ON THE PREMISES. ALTERNATIVE STORAGE SPACE IS PROCURED AND THE VEHICLES ARE MOVE TO THAT SITE. IF REWORK IS REQUIRED, THE REPAIRMEN NEED TO KNOW WHAT OPERATIONS MUST BE PERFORMED ON A SPECIFIC VEHICLE. SINCE YOU CAN'T TELL FROM JUST LOOKING AT THE VEHICLE, MY TEAM DEVELOPED A PORTABLE WIRELESS SYSTEM TO ADDRESS THE NEED. USING SIMPLE OFF THE SHELF COMPONENTS, CELL PHONE TECHNOLOGY, WIRELESS HAND HELD TERMINALS WITH BARCODE SCANNERS THE REPAIRMEN CAN GO

TO THE REMOTE SITE, LOCATE A SPECIFIC VEHICLE, INQUIRE AS TO ANY OPEN ITEMS, PERFORM THE REPAIR AND "BY OFF" OR UPDATE ITS CONDITION IN THE DATABASE.

IN ALL OF OUR ASSEMBLY PLANTS AND MANY OF OUR POWERTRAIN PLANTS WE HAVE INSTALLED A PLANT WIDE FACTORY INFORMATION SYSTEM. THIS INFORMATION SYSTEM MONITORS ALL MACHINES, ROBOTS AND OTHER COMPUTERS AND COMMUNICATION DEVICES. AS THE MACHINES ARE BUILT WE REQUIRE OUR SUPPLIERS TO PROVIDE DIAGNOSTICS, STATUS AND CYCLE TIMINGS TO OUR SPECIFICATIONS IN ALL THEIR MACHINE CONTROLLERS. THESE MESSAGES FLOW UP TO MONITORING COMPUTERS, UNSOLICITED, WHICH IN TURN PROVIDE GRAPHICAL AND DETAIL STATUS INFORMATION TO MANAGEMENT, OPERATIONS AND MAINTENANCE PERSONNEL. HISTORICAL DATA IS KEPT TO FACILITATE DISCRETE SIMULATION ANALYSIS AS WELL AS THROUGHPUT AND PRODUCTIVITY ANALYSIS.

THERE IS A SIGNIFICANT CHALLENGE TO THIS FACTORY INFORMATION SYSTEM AND ALL OTHER SYSTEMS THAT COMMUNICATE DIRECTLY WITH PLANT FLOOR EQUIPMENT. WE ARE JUST ENTERING THE WORLD OF PC BASED CONTROLS, WHICH AT THE VERY LEAST WILL REQUIRE A COMPLETE REVAMP OF ALL OUR COMMON COMMUNICATION DRIVERS AND THE COMMON DIAGNOSTIC CODE SPECIFICATIONS WE PROVIDE

OUR MACHINE SUPPLIERS. PC BASED CONTROLS WILL ALSO BRING THE POWER AND FLEXIBILITY OF THE DESKTOP PC (ALONG WITH ITS MAINTENANCE AND SUPPORT PROBLEMS) TO THE MACHINE CONTROL WORLD. THIS MIGRATION WILL BE DIFFICULT, REQUIRING A MASSIVE TRAINING EFFORT WITH NEW PROCEDURES AND CONTROLS.

DIGITAL MANUFACTURING IS AN APPLICATION THAT HAS A HUGE POTENTIAL FOR MANUFACTURING. IT WILL BRING TO VOLUME PRODUCTION THE KINDS OF PRODUCTIVITY AND QUALITY IMPROVEMENTS THAT THE DIGITAL TOOLS HAVE BROUGHT TO PRODUCT DESIGN AND ENGINEERING. LINKING THE VEHICLE GEOMETRY TO PROCESS DESIGN, TOOL AND FACILITY DESIGN, TOOL AND FACILITY BUILD AND LAUNCH AND PRODUCTION WILL DRIVE HUGE SAVINGS IN TIME, MONEY AND PEOPLE. WE ARE PILOTING SOME OF THE TECHNOLOGIES AND MORE IMPORTANTLY WORKING WITH OUR CUSTOMERS TO DEFINE AND REFINE THEIR PROCESSES TO UTILIZE THE NEW TOOLS. THE TOOLS THEMSELVES ARE NEW AND IN VARIOUS STAGES OF FUNCTIONALITY AND USABILITY. IN SHORT A LOT OF PROMISE, BUT MANY FUNCTION AND INTEGRATION ISSUES -- AS MANY SOFTWARE VENDORS SAY -- "THAT FEATURE WILL BE AVAILABLE IN THE NEXT RELEASE".

WE NEED INDIVIDUALS WHO HAVE HAD SOME EXPOSURE TO THESE TOOLS AND MORE IMPORTANTLY THE CONCEPTS AND PROCESSES THAT ARE ASSOCIATED WITH THEIR USE.

THE AREA OF TELEMATICS IS ONE THAT I FIND VERY INTERESTING AND PUZZLING. IT CONTAINS AN EXCITING ARRAY OF TECHNOLOGY WITH A BROAD RANGE OF POTENTIAL APPLICATIONS. THE PUZZLING PART IS THE VALUE PROPOSITION TO A MANUFACTURER AND MORE IMPORTANTLY TO THE CUSTOMER. WHAT WILL THE MASS MARKET WANT IN THE WAY OF ESSENTIAL SERVICES AND WHAT WILL THEY BE WILLING TO PAY FOR? WHAT IS THE PROPER MODEL FOR SERVICES, SHOULD THE SYSTEM CONSIST ENTIRELY OF IMBEDDED HARDWARE AND SOFTWARE, OR SHOULD THE PHONE THAT YOU WEAR ON YOUR BELT BE THE CENTER OF THE UNIVERSE? SHOULD THE VEHICLE SERVE TO ENHANCE THE EQUIPMENT AND SERVICES THAT ARE AT YOUR FINGERTIPS WHEN YOU ARE NOT IN YOUR VEHICLE? THESE ARE THE QUESTIONS WE ARE WRESTLING WITH, AND AS YOU MAY HAVE READ, THE FIRST OFFERING FROM THE CHRYSLER GROUP WILL BE CENTERED AROUND PERSONAL CALLING WITH A BLUETOOTH ENABLED CAR AND PHONE.

FROM A TECHNOLOGY STANDPOINT, THIS IS A WIDE-OPEN AREA THAT WE HAVE ONLY BEGUN TO ADDRESS. THE DISCIPLINES NEEDED COVER A BROAD SPECTRUM – WIRELESS COMMUNICATION, HIGHSPEED LONG

AND SHORT MESSAGE TRANSMISSION, ACCURATE COORDINATE OR GPS LOCATION, OPEN SYSTEM VEHICLE PROGRAMMING, PREDICTIVE TRAFFIC CONTROL AND AVOIDANCE – TO NAME A FEW.

SO THOSE ARE SOME BRIEF EXAMPLES OF SYSTEMS AND APPLICATIONS THAT WE ARE USING AND DEVELOPING FOR OUR PLANTS AND VEHICLES. WHAT THEN ARE THE SKILLS AND TRAITS THAT WE LOOKING FOR IN YOUR STUDENTS?

FIRST, THERE MUST BE A STRONG TECHNICAL FOUNDATION. THIS HAS TO BE A GIVEN. I AM NOT GOING TO “E” OR “B2SOMETHING” AT YOU AT THIS POINT. THE VALUE OF THE WEB IS WELL KNOWN BY ALL IN THIS ROOM. WHAT TOOLS, LANGUAGES, SOFTWARE PACKAGES, DATABASE MANAGEMENT SYSTEMS AND HARDWARE A STUDENT IS SKILLED IN USING IS SECONDARY TO A STRONG UNDERSTANDING OF THE UNDERLYING CONCEPTS OF THE TECHNOLOGIES. IF THE SPECIFIC TOOLS THAT HAVE BEEN ACQUIRED DURING SCHOOLING ARE THE SAME THAT WE ARE USING IN OUR BUSINESS, SO MUCH THE BETTER. BUT SINCE THERE ARE SO MANY TOOLS AND PRODUCTS TO CHOSE FROM, THE LIKELIHOOD OF DIRECT ALIGNMENT WITH A SPECIFIC COMPANY IS SLIM. SO MORE IMPORTANT IS A FIRM GRASP OF FUNDAMENTALS AND THE ABILITY TO APPLY THAT KNOWLEDGE TO NEW TOOLS AND LANGUAGES. THE PEOPLE THAT HAVE THIS ABILITY, I HAVE

FOUND TO BE THE MOST SUCCESSFUL OVER TIME – BOTH TO THE ORGANIZATION AND TO THEMSELVES.

WHILE A STRONG TECHNICAL BACKGROUND IS IMPORTANT, I ALWAYS PREACH THAT FULLY 50% OR MORE OF THE VALUE OF AN IT WORKER IS HIS BUSINESS KNOWLEDGE. WHAT DOES HE OR SHE KNOW AND UNDERSTAND ABOUT VEHICLE ASSEMBLY, SALES AND MARKETING ACTIVITIES OR PRODUCTION CONTROL. THE REAL VALUE THAT WE SERVICE PROVIDERS, PROVIDE TO OUR CUSTOMERS IS THE ABILITY TO UNDERSTAND THEIR BUSINESS PROCESSES ON AN EQUAL LEVEL AND ENGAGE IN A MEANINGFUL DIALOG ON BUSINESS PROBLEMS, NOT JUST OPEN UP THE NOTE PAD AND TAKE DOWN ORDERS. THAT IS WHY IT IS SO IMPORTANT TO PREPARE THE STUDENTS WITH REAL BUSINESS EXPERIENCE PRIOR TO GRADUATION.

MUCH OF THIS PREPARATION IS IN THE HANDS OF THE STUDENT. THOSE STUDENTS, WHO SEEK OUT SUMMER INTERNSHIPS IN THEIR FIELDS OF STUDY, GAIN VALUABLE “REAL WORLD EXPERIENCE” THAT GREATLY ENHANCES THEIR HIREABILITY. MORE AND MORE COMPANIES, DAIMLERCHRYSLER INCLUDED, USE THE SUMMER INTERN PROGRAMS AS A WAY TO “TEST DRIVE” POTENTIAL EMPLOYEES. ONE OR TWO THREE-MONTH ASSIGNMENTS ARE A MUCH BETTER PREDICTOR OF FUTURE PERFORMANCE THAN SEVERAL 30-MINUTE

INTERVIEWS. YOUR INSTITUTIONS ALSO AID THIS DEVELOPMENT, WHEN YOU ASSIGN GROUP PROJECTS THAT DEAL WITH ACTUAL BUSINESSES IN THE AREA, RATHER THAN PURELY CONTRIVED, ASSIGNMENTS. WHILE THIS IS A DIFFICULT PROCESS TO COORDINATE AND SUSTAIN, THE EXPERIENCE GAINED BY THE STUDENTS IS INVALUABLE. CONTINUE THE PROJECTS THAT REQUIRE TEAMWORK. WE HAVE VERY FEW JOBS THAT REQUIRE AN INDIVIDUAL TO LOCK HIMSELF UP IN A ROOM WHERE WE THROW IN FOOD AND HE PUMPS OUT WORK. TRY TO MAKE THE TEAMS AS DIVERSE AS POSSIBLE – IT'S GREAT PRACTICE.

THERE IS ALSO A NEED FOR A NEW SKILL THAT FOR THE AUBURN HILLS DAIMLERCHRYSLER IT GROUP IS BECOMING VERY IMPORTANT – THAT IS VENDOR MANAGEMENT. DUE TO THE FIERCE COMPETITION IN THE AUTOMOBILE BUSINESS AND THE CONSTANT COST PRESSURES, OUR BUDGETS WILL AT BEST STAGNATE, OR AT WORST CONTINUE TO ERODE. THE BUSINESS NEEDS FOR INFORMATION TECHNOLOGY, HOWEVER ARE NOT ERODING, BUT INCREASING. HOW DO WE MEET THE DEMAND? ONE WAY THAT WE HAVE CHOSEN IS A PROGRAM WE CALL “RITE SOURCING”. SIMPLY IT IS MOVING NON-CRITICAL MAINTENANCE AND ENHANCEMENT WORK OFFSHORE TO AREAS OF THE WORLD WHERE THERE ARE SKILLED WORKERS WITH MUCH LOWER WAGE RATES. THIS MODEL PRESENTS SEVERAL CHALLENGES.

MANAGE THE WORK, DELIVER VALUE FOR THE BUSINESS CUSTOMERS WITHOUT DIRECTLY MANAGING THE WORKFORCE. AND SECONDLY, MAINTAINING TECHNICAL AND BUSINESS EXPERTISE WITH THE SYSTEM PORTFOLIO. RATHER THAN MANAGING PEOPLE, OUR MANAGERS AND SUPERVISORS WILL BE MANAGING A PROCESS. THIS IS A BIG CHANGE, REQUIRING NEW SKILLS. THIS STRATEGY IS NOT NEW, BUT CERTAINLY GROWING, AND IS BEING USED IN ALL AREAS OF ENGINEERING.

WE HAVE TWO PROBLEM AREAS THAT I WANT TO TOUCH ON BRIEFLY. FIRST THE NEED TO MAINTAIN OUR EXISTING BUSINESS SYSTEMS. IN ENGLISH I'M TALKING ABOUT COBOL, CICS, DB2 AND IMS BASED SYSTEMS. THESE TECHNOLOGIES ARE NO LONGER GLAMOROUS, BUT THEY "RING THE CASH REGISTER" EVERY DAY AND WILL BE WITH US FOR SOME TIME TO COME. THE COST OF REPLACEMENT, JUST FOR REPLACEMENT SAKE IS NOT COST JUSTIFIABLE. SOME OF THE PROBLEM CAN BE ADDRESSED BY OUR RITE SOURCE INITIATIVE, BUT AS SOME OF OUR EXPERTS GET "LONG IN THE TOOTH" WE DO NOT HAVE READY REPLACEMENTS WAITING TO TAKE OVER.

FINALLY AND PERHAPS THIS IS AN OPPORTUNITY FOR OUR COMMUNITY COLLEGES, IS THE PROBLEM OF FINDING AND KEEPING QUALIFIED WORKERS FOR DATA CENTER OPERATIONS. THIS IS CERTAINLY NOT A GLAMOROUS JOB IT IS, STRESSFUL, DEMANDING, OFTEN REQUIRING

SHIFT WORK (MEANING 2<sup>ND</sup> AND 3<sup>RD</sup>) AS WELL AS WEEKENDS AND HOLIDAYS. THESE ARE GOOD JOBS WITH GOOD WAGES, BUT NOT WHAT A HOTSHOT COMPUTER SCIENCE OR TELECOM OR COMPUTER ENGINEERING BACHELOR'S GRAD IS LOOKING FOR AS A CAREER. AGAIN AS OUR WORKFORCE AGES, THE PEOPLE WHO HAVE GROWN UP IN THIS ENVIRONMENT RETIRE AND GOOD REPLACEMENTS ARE HARD TO FIND.

WELL THAT'S A BRIEF VIEW OF SOME OF THE SYSTEMS, TECHNOLOGIES AND PERSONNEL NEEDS AT DAIMLERCHRYSLER. I HOPE THAT MY REMARKS HAVE BEEN OF SOME INTEREST AND I WOULD BE GLAD TO ENTERTAIN ANY QUESTIONS THAT YOU MAY HAVE.